

WE CLAIM:

1. A process for continuously processing porous material in CVI furnace having a CVI chamber comprising loading the porous material into said CVI chamber, introducing a reactant gas into said CVI chamber while heating said porous material with a heater plate located proximate to said porous material, whereby said porous material is densified.

2. A process according to claim 1, wherein said porous material is placed into a module.

3. A process according to claim 1, wherein said porous material is removed from the CVI chamber and cooled down.

4. A process according to claim 1, wherein said heater plate is located above said module.

5. A process according to claim 1, wherein said heater plate is located below said module.

6. A process according to claim 4, wherein said CVI chamber includes an additional heater plate located below said module.

7. A process according to claim 1, wherein said gas flow is reversed during said process.

8. A process according to claim 1, wherein said reactant gas comprises natural gas.

9. A process according to claim 1, wherein said reactant gas comprises a mixture of methane and propane.

10. A process according to claim 9, wherein said mixture comprises about 92.5% methane and about 7.5% propane.

11. A process for continuously processing porous material in CVI furnace having a CVI chamber which is maintained at a desired temperature, pressure and flow rate comprising loading the porous material into said CVI chamber, introducing a reactant gas into said CVI chamber while heating said porous material with a heater plate located proximate to said porous material, whereby said porous material is densified.

12. A process according to claim 11, wherein said porous material is placed into a module.

13. A process according to claim 11, wherein said porous material is removed from the CVI chamber and cooled down.

14. A process according to claim 11, wherein said heater plate is located above said module.

15. A process according to claim 11, wherein said heater plate is located below said module.

16. A process according to claim 14, wherein said CVI chamber includes an additional heater plate located below said module.

17. A process according to claim 11, wherein said gas flow is reversed during said process.

18. A process according to claim 11, wherein said gas comprises natural gas.

19. A process according to claim 11, wherein said gas comprises a mixture of methane and propane.

20. A process according to claim 19, wherein said mixture comprises about 92.5% methane and about 7.5% propane.

21. A process according to claim 11, wherein said temperature is maintained in the range of about 1700 to about 2500° F.

22. A process according to claim 11, wherein said pressure is maintained in the range of about 50 to about 760 torr.

5 23. A process for continuously processing multiple layers of porous material in CVI furnace having a CVI chamber which is maintained at desired process conditions comprising loading the layers of porous material into said CVI chamber, introducing a reactant gas into said CVI chamber while heating said porous material with a heater plate located proximate to said porous material,
10 whereby said porous material is densified.

24. A process according to claim 23, wherein said layers of porous material are stacked into a module.

25. A process according to claim 23, wherein said reactant gas flow is reversed during said process.

15 26. A process for processing porous material in CVI furnace having a CVI chamber which is maintained at desired process conditions comprising placing porous material into a module, loading the module into said CVI chamber, introducing a reactant gas into said CVI chamber while heating said the porous material in said module with a heater plate located proximate said porous material,
20 whereby said porous material in said module is densified.

27. A process according to claim 26, wherein said heater plate is above the module.

28. A process according to claim 26, wherein said CVI chamber includes an additional heater plate below said module.

25 29. A process according to claim 26, wherein said reactant gas flow is reversed during the process.

30. A module according to claim 26 comprising a graphite block having a top gas chamber with gas inlet and several gas outlets, a middle chamber having gas inlets and gas outlets, wherein said gas inlets connect to said top gas chamber outlets, and a bottom gas chamber having gas inlets and a gas outlet, wherein said gas inlets connect to said middle chamber gas outlets.

31. A module according to claim 30, wherein porous material is placed into said middle chamber of said module.

32. A module according to claim 30, wherein a screen is placed above said porous material.

33. A module according to claim 32, wherein a screen is placed below said porous material.

34. A module according to claim 26, comprising a ceramic block having a top gas chamber with gas inlet and several gas outlets, a middle chamber having gas inlets and gas outlets, wherein said gas inlets connect to said top gas chamber outlets, and a bottom gas chamber having gas inlets and a gas outlet, wherein said gas inlets connect to said middle chamber gas outlets.

35. A module according to claim 34, wherein porous material is placed into said middle chamber of said module.

36. A module according to claim 34, wherein a screen is placed above said porous material.

37. A module according to claim 35, wherein a screen is placed below said porous material.

38. A module according to claim 26, comprising a block having a top gas chamber with gas inlet and several gas outlets, a middle chamber having gas inlets and gas outlets, wherein said gas inlets connect to said top gas chamber

outlets, and a bottom gas chamber having gas inlets and a gas outlet, wherein said gas inlets connect to said middle chamber gas outlets.

39. A module according to claim 38, wherein porous material is placed into said middle chamber of said module.

5 40. A module according to claim 38, wherein a screen is placed above said porous material.

41. A module according to claim 40, wherein a screen is placed below said porous material.

10 42. A process according to claim 8, wherein ethane and propane is added to the natural gas.

43. A process according to claim 18, wherein ethane and propane is added to the natural gas.

15 44. A process according to claim 26, wherein the heater plate has a first thickness at its center and a second thickness at its periphery whereby the second thickness is larger than the first thickness.

20 45. A process for processing porous material in a conventional CVI furnace having a CVI chamber which is maintained at desired process conditions comprising placing porous material into a module, loading the module into said CVI chamber, introducing a reactant gas into said CVI chamber while heating said the porous material in said module with a heater plate located proximate said porous material, whereby said porous material in said module is densified.

46. A process according to claim 45, wherein the heater plate has a first thickness at its center and a second thickness at its periphery whereby the second thickness is larger than the first thickness.